**3GPP TSG-SA WG6 Conference call S6-23xxxx**

**Conf call 29th March 2023 (revision of S6-23xxxx)**

Source: one2many

Title: end-to-end flow for payload carrying message

Agenda Item: x.x

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*Abstract: Discussion on end-to-end flow for a payload carrying message that may or may not be subject to store and forward. Forwarding a stored message is subject to availability and reachability.*

# Definitions

First, a definition for (un)availability

A UE is available when:

* The UE has registered without providing Communication Availability information, or
* The UE has registered and provided Communication Availability information which indicates the UE is available.

A UE is unavailable, and shall not be 'disturbed' when:

* The UE has deregistered, or
* The UE has registered and provided Communication Availability information which indicates the UE is unavailable.

Then, a definition for reachability

A UE is reachable when:

* A message can be delivered to the UE.

# End-to-end flow for messages that carry the payload IE

The e2e flow is listed in bulleted steps:

* The MSGin5G Server receives a message that includes the payload IE as specified in 8.3.2 (in the TS we now call this an inbound message; stage 3 uses that terminology too)
* The Server verifies the request and authorizes the sender
  + If the validation or authentication fails the Server returns a failure response and the procedure stops, else
* The Server checks the recipient's Service ID
  + If the Service ID is not in the domain of the Server, the Server forwards the request to the appropriate MSGin5G Server as specified in (…, not yet specified how that should work; we only have a deployment model, but no procedure yet), else
* The Server checks:
  + The recipient's Communication Availability information if the recipient is available, or
  + if the recipient's Communication Availability information is not available, the Server checks if the recipient has registered, and
  + Optionally, if the recipient is available the Server checks if the recipient is reachable as specified in 8.9.2
* If the recipient is:
  + Available and reachable, the Server delivers the message as specified in 8.3.3 (in the TS we now call this an outbound message) and the procedure stops, or
  + Available but reachability is unknown, the Server attempts to deliver the message as specified in 8.3.3, and
  + If message delivery failed because the recipient is unreachable, the Server performs Device Triggering as specified in 8.9.3 to wake up the recipient, and subsequently
  + The Server delivers the message as specified in 8.3.3 and the procedure stops
* If the recipient is not available or not reachable, the Server checks:
  + If the sender has requested S&F services
    - If the sender has not requested S&F services, the Server discards the message and returns a failure response to the sender and the procedure stops, or
    - If the sender has requested S&F services, but the recipient has opted out of receiving stored messages, the Server discards the message and returns a failure response to the sender and the procedure stops, else
    - The Server stores the message for deferred delivery and the Server returns a response to the sender informing the sender the message is stored for deferred delivery

The Store and Forward procedure in 8.2.6 should be as follows:

Pre-condition for the S&F procedure to start is that a message is stored for deferred delivery.

* The Server determines the recipient has become available (see definitions on availability above) and the storage time of the message has not yet expired
  + If the expiration time of the message has expired the Server discards the message and the procedure stops, else
* The Server, optionally, checks if the recipient is reachable as specified in 8.9.2
  + If the recipient is not reachable, the Server performs Device Triggering as specified in 8.9.3 to wake up the recipient
* The Server delivers the message as specified in 8.3.3
  + If delivery was successful the procedure stops, otherwise
  + If delivery failed, it is implementation dependent if the Server attempt delivery again, otherwise the Server discards the message, and the procedure stops

If the sender has requested the Delivery status, the recipient will send the Delivery status as a separate point-to-point message to the sender as specified in 8.3.4 and 8.3.5.

# Response messages

Generally:

* If message delivery fails, the Server returns a failure response to the sender
* If the message is stored for deferred delivery and the sender has requested Delivery status, then the Server informs the sender the message is stored for deferred delivery
* If message delivery is successful and the sender has requested Delivery status, then the recipient will notify the sender about the Delivery status in a separate point-to-point message as specified in 8.3.4 and 8.3.5.

### Issue in the TS:

Clause 8.3.6 now contains step 7 where the Server sends a response to the sender. However,

1. if the sender has requested a delivery report, the sender will receive 2 reports
2. if the sender has sent a group message or a topic message and has also asked for a delivery report, the sender receives twice the number of reports as there are group members or topic subscribers.

And, if the message is delivered as per 8.3.3 there is no response to the sender.

Hence, step 7 needs to be removed from 8.3.6.